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we may well be surprised that the faunas seem to have undergone so little modification. It was not quite the same, as we have seen, with our own race—for during the period man passed through all the successive stages of culture, from the very primitive Chellean to the relatively advanced Magdalenian type.

There are many other topics discussed in the 1190 pages of MM. Penck's and Brückner's treatise which we should like to have indicated, but space forbids. We shall have written to little purpose, however, if some notion of the general scope of the work cannot be gathered from our imperfect sketch. That our authors' results will have a strong influence on glacial research in other lands cannot be doubted. We shall now probably be spared the frequently reiterated statement that glacier-ice is a most ineffective eroding agent. Probably also the reality of the recurrence of alternating glacial and genial epochs throughout the Ice Age will no longer be so confidently disputed.

The book is well illustrated with numerous geological sections, maps, and photographs, and with the aid of these the reader should have no difficulty in following the descriptions and discussions of the text. It might have been well, however, if our authors could have seen their way to prepare a general map (preferably colored) to show the distribution of the glacial and fluvio-glacial deposits of the several epochs and stadia.

GEOGRAPHICAL RECORD

AMERICAN GEOGRAPHICAL SOCIETY

Meeting of the Society. A regular meeting of the Society was held at the Engineering Societies' Building, No. 29 West Thirty-ninth Street, on Tuesday Evening Feb. 15, 1910.

President Huntington in the chair.

The following persons, recommended by the Council, were elected to Fellowship:

Samuel P. Avery,	Henry Goldman,
Miss Rosa M. Batchelor,	Countess Spottiswood Mackin,
Robert Brundrett.	

The occasion was marked by the conferring of the Charles P. Daly Medal upon Colonel Charles Chaillé-Long. In the presentation of the medal, President Huntington said that the special service to geography by Colonel Chaillé-Long, which the Society thus desired to commemorate, was summed up in the inscription on the medal, which he read as follows:

"Awarded in MCMIX to Charles Chaillé-Long in recognition of valuable additions to geographical knowledge made by him in Africa. In 1874 he explored the unknown Nile north of Urondogani, discovered Lake Ibrahim and supplied the final evidence needed to prove that the river issuing from Victoria Nyanza is the Nile."

In his remarks on receiving the medal Colonel Chaillé-Long said in part:

"Mr. President: I am deeply touched by your flattering allusions to my share in the final solution of the Nile Source problem. As the only American to attach his name to the discovery of the Nile sources, it was the idea of *pro patria America* which inspired and stirred me to the achievement for which you have awarded me this great honor. I accept this medal with profound thanks and appreciation of the honor it confers. The pleasure I experience is saddened by the absence of one who was an affectionate and devoted friend and advocate, your lamented librarian, the late George C. Hurlbut.

"Mr. President, on this occasion it is fitting to make honorable mention of the American military mission to Egypt, of which I was a member, and which added prestige and honor to the American name in Egypt and Africa. The mission was semi-official, inspired by Gen. Sherman when General-in-Chief of the United States Army. It was composed of Federal and Confederate officers, ten of the former being officers actually in the United States Army detached on a year's leave of absence. Its purpose was partly scientific and it was employed by the progressive Ismail Khedive in scientific objects, among which was the final discovery of the Nile sources.

"It was an American who designated Tel-el-kebir as a defense against a threatened Turkish invasion; an American who made the preliminary hydrographic studies in 1870 which became the inspiration of the dam at Assouan a generation later; an American who, charged with the coast defenses of Egypt, constructed a counterpoise disappearing battery, which has since been adopted by the United States Government; an American who made a treaty with Uganda adding that country to Egypt, and navigating the unknown Victoria Nile, discovered lake Ibrahim, thus completing the work of Speke and Baker; an American who, having pushed the limits of Gordon's government south, extended it westward towards the Atlantic and eastward to the Indian Ocean to Kismayu and Mombasa. The latter port has since served as a point of penetration of the railroad from Mombasa to Uganda; an American who discovered the Wadi Raiyan, for which he holds the control. It would add another reservoir whose drainage capacity this year alone would have saved fifteen per cent. of the cotton crop. Used as a reservoir, it would double the summer supply of the Nile Beni-Zoef; Americans, finally, of the United States navy and marine corps, in 1882, saved thousands of lives, including those of the Khedive and family, and saved the city of Alexandria, the great seaport of Northeastern Africa, from entire destruction in 1882.

"Mr. President, I would add a tribute to my chief, the late General Charles Gordon, with whom I had the honor to serve as Chief of Staff, and who promptly recognized my share in the solution of geographical problems.

"Gordon was an officer of the Royal Engineers of the British Army. Had Gordon not been an Englishman he would have been an American. He has been misunderstood and misrepresented by his own countrymen. I had myself misunderstood some of his methods which seemed to me at the time illogical, but I gave to him during my service of three years, absolute devotion to the attainment of his object. I have never subscribed to the attribution to him of what Burton called excessive "religiosity." I believed, on the contrary, that he was actuated rather by all the legitimate aspirations of a soldier; in a word, he was more soldier than saint.

Mr. President, I renew my thanks for and appreciation of the great honor this Society has conferred upon me, and to cite a line from Horace: "Alboque dies notanda lapillo"—this day is marked by me with a white stone.

President Huntington then introduced the speaker of the evening, Professor James H. Brewster of the University of Michigan, who addressed the Society on "From Bahia to Buenos Aires." Stereopticon views were shown.

The Society then adjourned.

NORTH AMERICA

Sales of the U. S. Geological Survey Maps. Last year the Survey sold 475,636 topographic maps and 15,556 geologic folios. Formerly these folios were published only in folio form, but owing to the demand for a smaller size, the Survey has recently adopted an octavo or pocket form and will hereafter publish all folios in both forms. The octavo or book form will slip readily into a large coat pocket, and its price is 50 cents or double that of the folio, though in orders of $5. or more the price of the book is 30 cents.

Government Irrigation Work in the West. In the *National Geographic Magazine* (Vol. 20, pp. 403-37, 1909), Mr. C. J. Blanchard, of the United States Reclamation Service, under the title, "The Call of the West," gives a graphic account of the work which has been and is being done by the Government in irrigating the arid West. Irrigation is, fundamentally, a climatic problem. Given sufficient rainfall, properly distributed throughout the year, and irrigation is unnecessary. Given a rainfall too small for purposes of agriculture, or a rainfall irregularly or unsatisfactorily distributed through the year, and irrigation becomes essential. Thus, all irrigation undertakings are inevitably of interest to climatologists. Mr. Blanchard makes an estimate, which he considers "conservative," that 30,000,000 acres of land will be reclaimed in the arid West. He gives an account of all the Government irrigation projects, with an abundance of illustrations showing the condition of the country before and after the water was supplied. There is also a useful sketch-map on which the location of the reclamation projects is shown. Up to January 1, 1909, the Reclamation Service has built more than 3,458 miles of canals and ditches, which, if placed end to end, would reach from New York to San Francisco. It has built 338 miles of roads, most of them in a country heretofore inaccessible. Nearly 1,000,000 acres are now ready for irrigation, embracing 4,686 farms. As a result of the activities of this Service, more than 20,000 people are now established in homes in the arid West.

R. DeC. Ward.

SOUTH AMERICA

Dr. Wilhelm Sievers' latest travels in South America. The results of Dr. Sievers' studies of the geography of the northern cordillera of South America and of their former and present glaciation have long been before the public. Means were provided in Germany for the renewal of his work, last year. He reached Buenos Aires on March 20 and left the continent at Guayaquil on Oct. 29, having spent six months in extensive journeys among the mountains of Peru and Ecuador. He collected a large amount of new material, especially relating to glacial phenomena, and considerable of it in virgin territory. Dr. Sievers has published an itinerary with a map of his routes in *Petermanns Mitteilungen* (Vol. 56, p. 24). The publication of his latest results will be awaited with interest.

STANDARD TIME FOR CHILE. Some two years ago, Peru adopted, as standard time, the 75th meridian west of Greenwich, which cuts the republic into nearly equal eastern and western parts. Chile has now followed Peru's example, though the 75th meridian lies to the west of the republic, excepting where it cuts the Peninsula of Taytao in the Province of Chiloé and some of the islands of the Magallanes Territory. This fact, however, will not interfere with the practical convenience of the new time standard, as Chile will have the same time as Peru and the eastern part of the United States, or in other words, five hours later than Greenwich time.

AFRICA

GOLD OUTPUT OF THE TRANSVAAL. The Transvaal colony made a new record in gold production, in the fiscal year, July, 1908-June, 1909. The tables given in the *Annual Report* of the Government Mining Engineer, for the year ending June 30, 1909, show that the total value of gold mined was $154,929,830. The Witwatersrand produced $149,484,130 of this amount. The Transvaal has thus again produced not only a far greater quantity of gold than any other country, but its output for the year was about 34 per cent. of the product of the world. The colony's coal industry is also growing, the output having been 3,312,413 short tons. The number of men employed in the Transvaal mining industries was 21,720 whites, 12,206 Chinese and 189,200 blacks.

FROM HAUSSA LAND TO EGYPT THROUGH THE SUDAN. Dr. Karl Kumm has made a preliminary report, with a map of his route, on his journey eastward throug the Sudan in 1908-9 (*Pet. Mitt.,* Vol. 56, p. 84, 1910). In the course of this journey he traversed three hitherto unexplored districts and visited about 70 towns and settlements not previously mapped. The first of these districts was in Northern Nigeria in the southern part of the Bautschi Mts., where he discovered several new mountain ranges; the second new region was in the French Shari territory on the lower course of the Bahr Salamaat and Bahr Auk; and the third was between Fort Archambault on the Shari river and Keffi Genji on the Bahr el Ghazal, a large territory embracing the regions Sinussi Ndele in Dar Kuti, Dar Banda and the watershed between the Nile-Congo and the Shari. Among his zoological discoveries were a new variety of the giraffe with three horns, the two in the rear being joined at the base, and a variety of the Buffalo with remarkably flat horns. He finally reached the Anglo-Egyptian province of the Bahr el Ghazal, with 200 half starved people, and arrived at Khartum on Dec. 3 last.

THROUGH UGANDA AND THE MOUNTAINS OF THE MOON. The lecture of Prof. Charles E. Fay, of Tufts College, before the Society on Dec. 21, with its accompaniment of superb lantern slides from the negatives of Vittorio Sella, afforded the opportunity to follow step by step the expedition of the Duke of the Abruzzi to the glacial sources of the Nile on the lofty summits of Ruwenzori in Equatorial Africa.

In his introduction, the lecturer gave a rapid sketch of this most versatile explorer, whose quests have been by sea and land, in the arctic ice and under the sun of the Equator, to the summit of Mt. Saint Elias, and, most recently, to the highest point of our globe ascended by man, to 24,400 feet, on Bride Peak in the Himalaya of Cashmere.

Starting from the port of Mombasa, of which a few views were shown, the journey of some 560 miles to Victoria Nyanza,—from sea-level to an altitude, on the high plains of Athi of 8,500 feet, and then descending to 3,862 feet at Port Florence, was touched upon, a single snap-shot taken from the moving train showing the profusion of game that has rendered this region famous. A few striking views of the lake itself followed, with the canoes of the natives, and particularly a spirited view of Ripon Falls, at the point where the waters of this great inland sea débouche to form the Upper Nile.

Uganda was entered at Entebbe and several views presented the general appearance of the British capital and the homes of foreign residents, contrasted with those of the natives. The gathering of the little army of porters and other attendants (300 in number), small groups and individual types of these Baganda negroes, and their joyous departure under their loads of 50 lbs. each, strung out along the highway far as the eye could reach, opened the story and pictured scenes of the march across Uganda—the second stage of the journey of about 900 miles from the coast to the icy goal—the stage ending at Fort Portal, 220 miles from Entebbe, and lying at the base of the outliers of Ruwenzori, yet separated therefrom by the most difficult and toilsome part of the journey.

The road to Fort Portal, the seat of a Government Commissioner, is a well-kept highway over a country varied with hill and dale, with clearing, forest, and morass. Many views were shown illustrating the landscapes, and many representing the camps and camp-life of the Expedition. Of especial interest were those showing the wrestling, dancing and other entertainments furnished by the porters, and the home scenes of the inhabitants,—groups of women bringing supplies, chiefs and their attendants bearing gifts of welcome, etc.

The first sight of the Ruwenzori range, seen high above the clouds and covering an angle of many degrees, at a distance of nearly 50 miles, was of great interest, as bringing within the range of vision the phenomena of all the zones—a view of arctic conditions from the belt of the Equator. Interesting again from the fact that when the view was taken, it was a picture of the unknown, all its detail enigmatical; yet a few weeks later, at the farewell view of the Expedition, the mystery had vanished, the summits had all been ascended and named, and the whole hydrographic system of the upper streams of the Nile that drain into Lakes Albert and Albert Edward had been surveyed from those snowy points of vantage.

Beyond Fort Portal, came the increased interest of the more difficult way, with its steep, densely wooded hills, its streams to be forded, and the intricate jungle of strange shrubs and trees, growing out of swampy earth, in which, by reason of the absence of changes of wet and dry, the fallen trunks retained their solidity almost intact, while in the moist air, thick moss enlarged to dropsical proportions the limbs of the gigantic trees of the region. 'Fine pictures were presented of this unique flora; especially beautiful was a green-tinted picture of the *lobelia Stuhlmanni* in full blossom.

A permanent camp was reached at a chilly, rain-frequented locality called Bujongolo, 12,460 feet above the sea, on June 6. From this point the first ascent of a peak of Mt. Baker was made, the first of a series of uniformly successful climbs. This camp was in the Mobuka valley to the southeast of the range, on a stream whose waters eventually reach Lake Albert Edward (south of the entire range), which in turn empties by the Semliki river into Lake Albert to the north of Ruwenzori. A low pass to the west of the camp led over into the valley west of Mt. Baker, in the direct watershed of the Semliki. From this (later called "Freshfield Pass"), the ascent was made to the highest summit of Mt. Baker, to which the name of "King Edward Peak" was given. From this summit Sella afterwards secured a fine panorama of the nearby snowy giants which were severally shown upon the screen. The nearly complete topography of the range is comprehended in this panorama.

Ruwenzori—once usually spoken of as a mountain—was found to be a great complex of mountain masses, lying along the water parting, not of the Nile and the Congo, but of those waters of the Nile that flow eastward and those flowing more directly to the Semliki and so to Lake Albert. To these massifs the Duke gave the names of the principal explorers of the sources of the Nile; Stanley, Baker, Speki, Gessi, Emin, and to the southernmost he applied the name of Thomson. At the urgent request of the Royal Geographical Society, he later consented that the name Luigi di Savoia should be substituted for Thomson. Upon each massif rise several individual summits, to which separate names have been given. Mt. Stanley has five of these, to the two highest of which the names of the dowager queen of Italy and the queen of England were given by the prince on the occasion of his first ascent. Margherita attains 16,815 feet; Alexandra, 16,749.

The lecturer read from the manuscript of the lecture given by Sella in Turin before an immense concourse including members of the royal family, the Duke's own account of this culminating success of his expedition, as he conveyed the news by a letter dispatched through a messenger to the members of the party at the more distant camp. Views taken during the ascent of the highest peaks were shown as the vivid narrative from the explorer's own lips proceeded, a story thrilling with the spirit of adventure and the most ardent patriotism.

Remaining five weeks in the region, the Duke personally ascended thirteen of the eighteen summits of the several massifs, omitting only three of the less difficult and rewarding. Careful measurements were made of the peaks, nine of which exceed the altitude of Mont Blanc, and the topography and hydrography were carefully studied and have since been mapped.

ASIA

Mr. Douglas Carruthers' Journey in North-Western Arabia. This naturalist made a journey, last year, in Arabia, starting from Jesi on the Hedjaz R. R., 22 miles east of the Dead Sea, travelling about 350 miles south-west, to the oasis of Teima and returning by routes partly east and partly west of his southern march. He describes his journey in the *Geographical Journal* (Vol. 35, pp. 225-45, with map).

He traversed a region that was practically unknown for most of the way and his narrative gives very interesting descriptions of the nomads and of the different phases of the country. His starting point, Jesi, is the limit of cultivation for all is desert to the east of it. He first visited the Belka, the headquarters of the Beni Sakhr, a Beduin people who derive their strength and wealth from this transition country where they have good pasturage for their large herds of camels and flocks of sheep and goats. They are the boldest of robbers and possess many rifles but their sheikh proved a good friend. They were living in about 1,000 tents scattered along the wadis. True nomads, for they do not cultivate, they range over the country to the east, falling back, from time to time upon their base.

Carruthers went with them as they sought new pastures. The camel provides them with meat, milk, clothing, tents and transport. They spend their lives in stock-breeding and systematic robbery. Now and then, the Beduins will go on a foray to steal camels and so increase their herds. They want rifles, which means power and with stolen camels, they buy more rifles. They buy wives with camels which, in fact, are their only means of exchange. They think nothing of killing if anything is to be gained thereby. In Beduin warfare the camp itself is never molested and the men go off to fight knowing that their camps will not be pillaged.

After a few days' march, Carruthers and his small party left the Beni Sakhr. The limestone plateau soon merged into the black desert or "the desert of flints" as the nomads call it, almost level, sprinkled over with countless flints, with almost no animal life excepting a few birds and desert hares, without dew fall, 3,000 feet above sea level, cut up by many wadis that carry much water when sudden storms occur. Among the few birds was the ostrich, an interesting discovery, for no traveller except Palgrave has mentioned sighting them in Arabia. For six days, the camels had no water and very little to eat.

The most southern point reached was the oasis of Teima, the first town of importance in Northwestern Arabia. The oasis forms a large patch of vegetation in an absolutely sterile basin. The inhabitants were quite friendly but the governor, representing the Emir of Hail, ordered the explorer to leave and had his servants rob him of all his money. This ancient oasis has a wonderful water supply and its great well pit is famous all over Arabia. Ninety camels can draw water at the same time and the supply is carried to the extreme parts of the oasis by a system of irrigation canals. It is doubtless a strong spring of pure artesian water that the natives have chanced to tap. A great deal of water apparently flows across Arabia but it is deeply hidden in the sandstones. The oasis produces citrus and some other fruits and tobacco. Dates which grow to perfection, are the staple food. Much rock salt is collected. The people are of the purest Arab stock and very handsome. The oasis is growing and, with its great water supply, it should have enduring prosperity. The people are very suspicious of strangers, Turks as well as strangers.

Mr. Carruthers escaped to the north in the night and for some days skirted the western edge of the Nafud, a sand dune region whose west limits had not hitherto been defined. This region supports considerable vegetation and a tall grass called "knusi" is good camel feed. On the way north, he was captured by a raiding party of Beduins who would have stripped him of all his possessions if their chief had not been friendly with the Beni Sakhr tribe under whose protection he had set out. He found at the well called Bayer, on the line of the supposed ancient trade route between Egypt and Busra, the ruins of a large caravanserai in the midst of the sterile desert which indicates an ancient prosperity that has long since disappeared. The explorer says that the Beduin near the Hejaz railroad were opposed to the building of the line, chiefly because it would take away from them the blackmail they have always imposed upon pilgrim caravans in exchange for safe conduct through their territory.

POLAR

SUCCESS OF DR. CHARCOT'S ANTARCTIC EXPEDITION. Dr. Jean Charcot, in command of the French Antarctic Expedition, arrived at Punta Arenas, Chile, on his exploring vessel *Pourqui Pas* on February 11. From this point he sent the following cablegram to France which has been communicated to the Society.

"I believe I have been able to carry out the scientific programme which had been arranged for my expedition by the Academy of Sciences. On our first voyage into the unknown, after reaching West Antarctica, we steamed to the southwest, along the west coast of the mainland and continued the survey of the coast which we had begun in our former expedition. Grounding in shallow waters caused us considerable trouble but we completed the map as far as Adelaide Island, a remarkable bit of land about 81 miles in length. South of it we discovered a very large gulf, surveyed 120 miles of new coasts and finally reached Alexander I Land which was the chief goal of our enterprise. It was a most inhospitable region with an ice bound coast, great glaciers and icebergs and no shelter for our vessel.

"We therefore returned north and wintered at Petermann island. The winter temperature was comparatively moderate but the weather was extremely disagreeable and a number of our party were sick. Fortunately, all recovered. We made a number of interesting excursions and particularly on the glaciers.

"Our second campaign included studies in the South Shetland islands especially on Deception and Bridgman islands. Then we returned to the south, discovered new lands to the west and south of Alexander I Land, relocated Peter I island and sailed between the 69th and 71st parallels as far as 126° W. Long. We wished to accomplish more but we have done the best we could."

A little later information is that the party suffered to some extent from scurvy and the ship was damaged by collisions with icebergs. The motor sledges were impracticable on bad ice and the supply of food and coal was not adequate.

THE DUKE OF ORLEANS' ARCTIC CRUISE IN 1909. Between June and September, last year, the Duke of Orleans made his third Arctic voyage on the *Belgica.* He was accompanied by the Antarctic explorer, Capt. de Gerlache, Dr. Récamier and the painter Ed. Mérite. His journey extended from the east coast of Greenland to Franz Josef Land. While hunting was the main object, an important oceanographic result was obtained. The *Belgica* reached the east coast of Greenland at Cape Hold With Hope (73° 30′ N.), then pushed further north, doubling Wollaston Foreland and took to the open sea, eastward, in about 78° N. The Duke improved the opportunity to complete the soundings of 1905 on Belgica Bank and he was able to fix the edge of the Greenland continental shelf in those waters. He found the edge of the shelf at 1,145 feet, that is to say, at a greater depth than usual. Such depths at the edge of the continental shelf seem especially to mark lands that have recently been subjected to great glaciation. The interesting fact was also noted that the edge of the polar current on the east Greenland coast seems to coincide with the edge of the continental shelf. Both going and coming, the expedition traced the edge of the pack ice between Spitsbergen and Franz Josef Land and ascertained the amount of its recession during the summer. (*Annales de Géog.,* Vol. 19, p. 95.)

RASMUSSEN'S PROPOSED EXPEDITION. The *Geographical Journal* prints a short paper (Vol. 35, pp. 295-9) by Knud Rasmussen on his coming expedition, the official name of which will be "The Danish Ethnographical Expedition to the Central Eskimo." He believes it to be all but settled that the Greenland Eskimo at Smith Sound include a number of families who are the last immigrants from the American Eskimo districts and that they came from the north-western part of Baffin Land or, in other words, between Bylot island and Fury and Hecla Strait. The Eskimo living there are among the least known of their race though the district they occupy is probably the thoroughfare from the continent to Greenland. He proposes to study these Eskimo and also their little known congeners in the Barren Lands of northern Canada, the northern coasts of Hudson Bay and westward along the northern sea coast to Coronation Gulf. He expects to start from Copenhagen on his ship, a small vessel of the Göa type, in the summer of 1911, and to make his first winter quarters in Fury and Hecla Strait where he will make his studies and sledge trips around and in North-western Baffin Land. Quarters for the second winter will be sought in Chesterfield Inlet, convenient for work among the inland Eskimo and those of the western coast of Hudson Bay; the third winter quarters are likely to be established in Repulse Bay at the neck of Melville Penisula and it is hoped to travel westward along the coast as far as the huts of the almost unknown Eskimo of Coronation Gulf. Besides the small crew, a geologist and a physician will be included in the party and it is hoped to do considerable scientific work outside the study of the Central Eskimo.

METEOROLOGY

THE ANTICYCLONIC BELT OF THE NORTHERN HEMISPHERE. In the *Quarterly Journal* of the Royal Meteorological Society (Vol. XXXV, No. 152, 1909), there is a paper by Col. H. E. Rawson, C. B., on "The Anticyclonic Belt of the Northern Hemisphere." In a previous communication, a few years ago, the author brought forward some facts relating to the anticyclonic belt of the southern hemisphere, derived from an examination of the South African records from the year 1841 to 1906. He found that the cyclical oscillations of the belt to and from the equator over South Africa were strong enough to encourage the belief that an analysis of Australian records on the one side, and of Argentine records on the other, would prove that all the action-centers of the atmosphere were moving together over this wide area, and that a similar oscillation existed in the northern hemisphere. Col Rawson subsequently found that the investigations of Mr. H. C. Russell and Dr. W. J. S. Lockyer supported his conclusion that there is a period of about 9.5 years between the greatest south position of the anticyclonic belt in the southern hemisphere, the double oscillation thus taking 19 years. He has since extended his inquiry into the movement of the action-centers in the northern hemisphere, with a view to ascertaining whether they show any similar oscillation to and from the equator, which is not to be explained by seasonal changes of position. Dealing with the Nile floods, he draws the inference that the high-pressure systems which affect northeast Africa are farther north when the floods are in excess, and nearer to Egypt when they are deficient. He has also made an analysis of the tracks of hurricanes which passed north and south of the Manila Observatory, and finds that these throw an interesting light upon the oscillations of the action-centers of the atmosphere. R. DEC. WARD.

PHYSICAL GEOGRAPHY

GLACIATION IN SOUTHERN CALIFORNIA. The recent announcement of former glaciers in the San Bernardino Range, California, is of much interest (H. W.

Fairbanks and E. P Carey, *Science,* N. S. Vol. XXXI, 1910, 32-33). This brings mountain glaciers as far south as the latitude of Atlanta, Ga. and Charleston, S. C. where previously they had not been known in the United States south of the Sierra Nevada and the San Francisco peaks in Arizona. There seems to have been at least five glaciers, evidenced by cirques, lakes, terminal moraines, etc. None of these glaciers descended below 8,500 feet. They owed their existence to high altitude and north or northeast slopes. LAWRENCE MARTIN.

PLEISTOCENE GEOLOGY OF THE LEADVILLE QUADRANGLE. The detailed study of mountain glaciers and glaciation in the United States has resulted in another strong contribution published by the U. S. Geological Survey (Pleistocene Geology of the Leadville Quadrangle by S. R. Capps, Jr. *Bull.* 386, U. S. Geol. Survey, 1909, pp. 1-96) Parts of the Park and Sawatch Ranges of Colorado have been mapped, including the basins of thirty-seven valley glaciers whose total area was 358 square miles. These glaciers were from two to twenty miles in length. They headed at from 13,700 to 12,000 feet above sea level and descended to from 10,300 to 8,800 feet.

Evidences of glacial erosion include striae, cirques, truncated spurs, U-shaped valleys, hanging valleys, etc. Lateral, terminal, and ground moraines were deposited The author finds small remnants of what he interprets as older drift, with which he associates the high terraces of the Arkansas valley. There are also low terrace gravels. The glacial changes of drainage are of no little interest. Post-glacial erosion is trivial. LAWRENCE MARTIN.

VARIOUS

GEOGRAPHICAL BIBLIOGRAPHY. The 18th volume of "Bibliographie Géographique Annuelle," for 1908, issued as a part of *Annales de Géographie,* contains 1,105 notices of geographical books and papers that were published in 1908. The plan is selective rather than exhaustive but practically all the best works are included. The distinctive feature is the analytical and critical notes that accompany nearly all the references. They are admirably done by the many authoritative writers who collaborate with Dr. Louis Raveneau, under whose direction the bibliography is published. These notes not only give a clear idea of the scope of each book and paper but often condense the more important information it contains so that the volume is not only a good bibliography but also a valuable work of geographical reference. This feature has given to the annual a place of its own and the Paris publishing house of Armand Colin is to be congratulated upon the high estimation in which the book is held.

THE RETURN OF HALLEY'S COMET. This comet will cross the plane of the ecliptic on May 18 when it will be almost exactly between the sun and the earth, and the earth will probably be in the tail of the comet. Astronomers say that a fine display may be expected. The tail will probably be 20 or 30 degrees in length. The comet will best be seen at the end of May and a better view of it is anticipated in the United States than in more northern latitudes. Its history has been traced back to 240 B. C. and most of its returns have been recorded. It is believed that, in no case, can this comet return to perihelion unseen and therefore some of its reappearances were not recorded or the records perished.